Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): ~~Method~~ A method for the production of an electro-optical printed circuit board ~~(11)~~, having a number of layers ~~(24, 30)~~ with electrically conductive elements ~~(12)~~, and at least one optical layer ~~(13)~~ with optically conductive elements ~~(22), particularly with waveguides (22)~~,

wherein the at least one optical layer ~~(13)~~ has a polysiloxane material, and ~~that~~ wherein structuring of the elements ~~(22)~~ in a form of channel waveguides of the optical layer ~~(13)~~ takes place by means of casting into a casting mold ~~(21)~~ that contains the waveguide structures as a negative mold, whereby ~~the~~ a mechanical connection between the optical layer ~~(13)~~ and ~~the~~ at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers is produced in direct connection with the production of the optical layer ~~(13)~~.

Claim 2 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the mechanical connection between the optical

layer ~~(13)~~ and the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers is produced directly during the production of the elements ~~(22)~~ of the optical layer ~~(13)~~.

Claim 3 (Currently Amended): ~~Method~~ The method according to claim 2, wherein the optical layer ~~(13)~~ is formed from a core polysiloxane ~~(22)~~ having a higher index of refraction, as well as a first polysiloxane as a superstrate layer ~~(23)~~, having a low index of refraction, and a second polysiloxane as a substrate layer ~~(29)~~, having a low index of refraction, in the form of cover layers on the core polysiloxane ~~(22)~~.

Claim 4 (Currently Amended): ~~Method~~ The method according to claim 3, wherein the ~~superstrate~~ first polysiloxane ~~(23)~~ is applied to the core polysiloxane ~~(22)~~, which has already solidified, in liquid form, brought into connection with ~~a~~ the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers in its liquid phase, and subsequently cross-linked.

Claim 5 (Currently Amended): ~~Method~~ The method according to claim 3, wherein the ~~substrate~~ second polysiloxane ~~(29)~~ is

applied to the core polysiloxane ~~(22)~~, which has already solidified, in liquid form, brought into connection with ~~a~~ the at least one layer ~~(30)~~ of the electrically conductive printed circuit board layers in its liquid phase, and subsequently cross-linked.

Claim 6 (Currently Amended): ~~Method~~ The method according to claim 4, wherein after cross-linking of the superstrate polysiloxane layer ~~of~~ or the substrate layer ~~(29) or the superstrate (23)~~, the at least one layer ~~(24)~~ of the electrically conductive printed circuit board layers is mechanically fixed in place on the superstrate polysiloxane layer or the substrate layer ~~(23, 29)~~.

Claim 7 (Currently Amended): ~~Method~~ The method according to claim 3, wherein pit structures ~~(34)~~ of a casting mold ~~(21)~~ are filled with the core polysiloxane, the core polysiloxane ~~(22)~~ having a higher index of refraction, and hardened, in a first step; ~~a~~ the first polysiloxane having a low index of refraction is applied as ~~a~~ the superstrate layer ~~(23)~~, in a second step, in such a manner that ~~it~~ the superstrate layer bonds to the core polysiloxane, ~~(22),~~ the superstrate layer ~~(23) with~~ having the optically conductive elements ~~(22)~~ situated on the superstrate

layer; ~~it are~~ the superstrate layer with the optically conductive elements is separated from the casting mold ~~(21)~~, in a third step; and ~~a~~ the second polysiloxane having a low index of refraction is applied to the core polysiloxane ~~(22)~~ as ~~a~~ the substrate layer ~~(29)~~, in a fourth step.

Claim 8 (Currently Amended): ~~Method~~ The method according to claim 3, wherein the polysiloxane substrate ~~(29)~~ having the low index of refraction is produced by means of casting technology, with pit structures ~~(34)~~, in a first step; ~~that a~~ wherein the core polysiloxane ~~(22)~~ having a higher index of refraction is filled into the ~~pits (34)~~ pit structures in a second step to form a composite of polysiloxane substrate/core polysiloxane; and ~~that a~~ wherein the first polysiloxane having a low index of refraction is applied to the composite of polysiloxane substrate/core polysiloxane ~~(29, 22)~~ as ~~a~~ the superstrate layer ~~(23)~~, in a third step.

Claim 9 (Currently Amended): ~~Method~~ The method according to claim 3, wherein the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers has micro-structured spacers ~~(25, 31)~~ on ~~the~~ a side facing the ~~liquid~~ second polysiloxane in a liquid phase of the substrate layer ~~(29)~~

or the first polysiloxane in a liquid phase of the superstrate layer ~~(23)~~, respectively, which guarantee a defined thickness of the substrate layer ~~(29)~~ or superstrate layer ~~(23)~~, respectively.

Claim 10 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the mechanical connection between the optical layer ~~(13)~~ and the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers is produced subsequent to production of the optical layer ~~(13)~~.

Claim 11 (Currently Amended): ~~Method~~ The method according to claim 10, wherein the optical layer ~~(13), consisting of~~ comprises at least one of a polysiloxane substrate, a ~~(29) and/or~~ polysiloxane core, and a ~~(22) and/or~~ polysiloxane superstrate ~~(23),~~ and is first produced as an independent layer, and subsequently ~~brought into mechanical connection~~ mechanically connected with one or more layers ~~(24, 30)~~ of the electrically conductive printed circuit board layers either on one or both sides of the electrically conductive printed circuit board layers.

Claim 12 (Currently Amended): ~~Method~~ The method according

to claim 11, wherein the ~~connection of the~~ optical layer ~~(13)~~ is mechanically connected with ~~a layer (24, 30)~~ the one or more layers of the electrically conductive printed circuit board layers ~~is produced by means of~~ via lamination or gluing.

Claim 13 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the at least one optical layer with optically conductive ~~layer (22)~~ elements is handled jointly with the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers during ~~the~~ production of the electro-optical printed circuit board ~~(11)~~.

Claim 14 (Currently Amended): ~~Method~~ The method according to claim 1, wherein ~~the~~ adhesion promoters are used to support the mechanical connection of the polysiloxane material of the optical layer ~~(13)~~ with the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers.

Claim 15 (Currently Amended): ~~Method~~ The method according to claim 14, wherein a polymer layer that adheres well to the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers is applied to the optical layer ~~(13)~~ as an

adhesion promoter.

Claim 16 (Currently Amended): ~~Method~~ The method according to claim 1, wherein a physical and/or chemical treatment of ~~the~~ a surface of the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers, ~~which~~ said at least one layer ~~is~~ being connected with the optical layer ~~(13)~~, is performed in order to achieve activation of the surface for improved adhesion to the optical layer ~~(13)~~.

Claim 17 (Currently Amended): ~~Method~~ The method according to claim 16, ~~wherein~~ further comprising influencing adhesion properties of the at least one layer ~~(24, 30)~~ of the electrically conductive printed circuit board layers that is mechanically connected with the optical layer ~~(13) is influenced in its adhesion properties~~ with regard to the optical layer ~~(13) by means of~~ via flaming with gases.

Claim 18 (Currently Amended): ~~Method~~ The method according to claim 16, ~~wherein~~ further comprising influencing adhesion properties of the at least one layer ~~(24, 30)~~ of the electrically

conductive printed circuit board layers that is mechanically connected with the optical layer ~~(13) is influenced in its adhesion properties~~ with regard to the optical layer ~~(13) by means of~~ via plasma irradiation.

Claim 19 (Currently Amended): ~~Method~~ The method according to claim 1, wherein ~~the casting techniques for structuring~~ the optically conductive elements ~~(22)~~ are ~~carried out~~ structured by casting essentially at ambient temperatures.

Claim 20 (Currently Amended): ~~Method~~ The method according to claim 1, wherein during casting of the optically conductive elements ~~(22)~~, ~~the surface of the~~ a cast optically conductive surface of the optically conductive elements ~~(22)~~ is drawn off by ductors and thereby the casting mold ~~(21)~~ is filled completely.

Claim 21 (Currently Amended): ~~Method~~ The method according to claim 1, wherein ~~by means of the~~ via casting techniques for structuring the optically conductive elements ~~(22)~~, large-area structures of the optically conductive elements ~~(22) can be~~ are produced.

Claim 22 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the polysiloxane material ~~can be~~ has elastic properties and is unmolded ~~even~~ from casting technology depressions ~~(34)~~ having very steep walls or depressions having undercuts, without impairment, because of ~~its~~ the elastic properties of the polysiloxane material.

Claim 23 (Currently Amended): ~~Method~~ The method according to claim ~~1~~ 7, ~~wherein the~~ further comprising producing coupling elements ~~(14)~~ for optical coupling of the optically conductive elements ~~(22)~~ to electrically conductive elements ~~(15, 16, 17)~~ of the electrically conductive printed circuit board layers ~~(12)~~ to be functionally connected ~~are produced~~ at the same time when the optical layer ~~(13)~~ having the optically conductive elements ~~(22)~~ is cast.

Claim 24 (Currently Amended): ~~Method~~ The method according to claim 23, wherein the ~~casting molds (34)~~ pit structures for the optically conductive elements ~~(22)~~ possess beveled flanks at ~~the~~ ends ~~(33), preferably at 45°~~ of the pit structures; and wherein the optical layer has molded segments ~~(28) of the optical layer~~ that are ~~molded on in the optical layer (13)~~ are metallized locally ~~(28)~~

~~by means of these~~ via said flanks ~~(14)~~ after unmolding, and then ~~possess the~~ function ~~of~~ as integrated deflection mirrors ~~(14)~~.

Claim 25 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the optically conductive elements ~~(22)~~ of the optical layer ~~(13)~~ contain intersections, branches, mixers, wavelength multiplexers and wavelength de-multiplexers, and switching elements.

Claim 26 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the optically conductive layer ~~(22)~~ made of a polysiloxane material ~~permits~~ temperature stabilizes ~~stability of~~ the optical layer of the electro-optical printed circuit board ~~(11), for example during soldering processes up to essentially 250°C,~~ without impairment of ~~the~~ optical properties of the elements ~~(22)~~ of the optical layer ~~(13)~~.

Claim 27 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the printed circuit ~~boards (24) are~~ board is formed from at least one material selected from the group consisting of fiberglass-filled epoxy resin, ~~and/or~~ Kapton, ~~and/or~~

Teflon ~~and/or~~ and glass, ~~which are~~ the board not being provided with electrically conductive layers ~~(12)~~ at all, or provided with ~~them~~ electrically conductive layers on one side or both sides of the board.

Claim 28 (Currently Amended): ~~Method~~ The method according to claim 1, wherein the printed circuit ~~boards (24) used are~~ board is provided with electrical conductor tracks ~~(12)~~ on one side or both sides of the printed circuit board.

Claim 29 (Currently Amended): ~~Electro-optical~~ An electro-optical printed circuit board ~~(11)~~ produced according to the method of claim 1.

Claim 30 (Currently Amended): Use of an electro-optical printed circuit board ~~(11)~~ produced according to the method of claim 1 in multi-layer boards, wherein additional layers of the printed circuit board ~~(11)~~ or additional printed circuit boards ~~(11)~~ are added to a multi-layer composite, on one or on both sides of ~~the~~ a composite of optical layer ~~(13)~~ and layers ~~(24, 30)~~ that are connected with the optical layer ~~(13)~~, produced according to the method.

Claim 31 (Currently Amended): Use of an electro-optical printed circuit board ~~(11)~~ produced according to the method of claim 1 as a line-bound optical connection element, wherein ~~the~~ a composite of optical layer ~~(13)~~ and layers ~~(24, 30)~~ of the printed circuit board ~~(11)~~ connected with the optical layer ~~(13)~~, produced according to the method, is applied to a rigid carrier medium.

Claim 32 (Currently Amended): Use of an electro-optical printed circuit board ~~(11)~~ produced according to the method of claim 1 as a line-bound optical connection element, wherein ~~the~~ a composite of optical layer ~~(13)~~ and layers ~~(24, 30)~~ of the printed circuit board ~~(11)~~ connected with the optical layer ~~(13)~~, produced according to the method, is applied to a flexible carrier medium.

Claim 33 (Currently Amended): Use of an electro-optical printed circuit board ~~(11)~~ produced according to the method of claim 1 as an integrated optical component, wherein optical power splitters, optical mixers, optical switches, optical modulators, wavelength multiplexers, wavelength de-multiplexers, or optical attenuators are used as optical elements ~~(22)~~.